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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/785,058

02/25/2004

Sandu Margarit Smarandache

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07/26/2006

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CANADA

EXAMINER

PHAM, THOMAS K

ART UNIT

PAPER NUMBER

2121

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/785,058

**Applicant(s)**SMARANDACHE, SANDU  
MARGARIT**Examiner**

Thomas K. Pham

**Art Unit**

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 14-22, 27-34, 39 and 40 is/are rejected.
- 7) ☒ Claim(s) 10-13, 23-26 and 35-38 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/25/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**First Action on the Merits**

1. Claims 1-40 of U.S. Application 10/785,058 filed on 02/25/2004 are presented for examination.

**Quotations of U.S. Code Title 35**

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. The claims and only the claims form the metes and bounds of the invention. “Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ541, 550-551 (CCPA 1969)” (MPEP p2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. The Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

### **Claim Rejections - 35 USC § 102**

7. Claims 1-9, 14-22, 27-34 and 39-40 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,473,497 (“Beatty”).

#### **Regarding claim 1**

Beatty teaches the invention including a method of providing a controlled current to an electronic device, comprising: producing a pulse-width modulation (PWM) signal to provide said current (see C 4 L 34-45, C 5 L 46-54); measuring an average of said current provided to the electronic device using a dual-slope integrator (see C 4 L 46 to C 5 L 12); and setting a duty cycle of said pulse-width modulation signal based, at least in part, on said measuring (see C 5 L 13-34).

#### **Regarding claim 16**

Beatty teaches the invention including a system for providing a controlled current to an electronic device, comprising: a pulse-width modulation (PWM) signal generator for providing

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said current (see C 4 L 34-45, C 5 L 46-54); a dual-slope integrator for use in measuring an average current supplied to the electronic device, said measuring resulting in a measured average current (see C 4 L 46 to C 5 L 12); and a duty cycle calculator for calculating a duty cycle of said pulse-width modulation based, at least in part, on said measured average current (see C 5 L 13-34).

**Regarding claim 29**

Beatty teaches the invention including a computer-readable medium storing instructions which, when executed by a computing device in a system for providing a controlled current to an electronic device by way of a pulse-width modulation (PWM) signal (see C 4 L 34-45, C 5 L 46-54), cause said computing device to: (a) calculate from measurements produced by a dual-slope integrator a measured average current supplied to the electronic device (see C 4 L 46 to C 5 L 12); and (b) set a duty cycle of said pulse-width modulation signal based, at least in part, on said measured average current (see C 5 L 13-34).

**Regarding claim 2**

Beatty teaches said measuring an average of said current comprises: during a sampling interval, integrating a signal proportional to said current using said dual-slope integrator, said integrating resulting in an integrated signal (see C 6 L 19-36); determining a magnitude of said integrated signal (see C 6 L 36-51); and using said magnitude of said integrated signal and a length of said sampling interval to calculate a measured average current (see C 6 L 52-64).

**Regarding claim 3**

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Beatty teaches said integrating comprises charging a capacitor from an initial level to a final level and wherein said determining a magnitude comprises calculating a time for discharging said capacitor at a known rate from said final level to said initial level (see C 7 L 34-50).

**Regarding claim 4**

Beatty teaches wherein said sampling interval is a PWM period (see FIG. 2-5).

**Regarding claim 5**

Beatty teaches wherein said PWM period is a first PWM period, and wherein said determining a magnitude is performed during a second PWM period immediately following said first PWM period (see C 8 L 22-31).

**Regarding claim 6**

Beatty teaches wherein said setting a duty cycle is effective in said pulse-width modulation signal during a third PWM period immediately following said second PWM period (see C 8 L 22-31).

**Regarding claim 7**

Beatty teaches wherein said measuring an average of said current results in a measured average current and wherein said setting a duty cycle comprises: comparing said measured average current to an input value representing a desired average current; and regulating said duty cycle of said pulse-width modulation signal based on said comparing (see C 9 L 54 to C 10 L 15).

**Regarding claim 8**

Beatty teaches wherein said input value is a digital representation of an input voltage (see C 10 L 15-20).

**Regarding claim 9**

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Beatty teaches wherein said duty cycle is computed by scaling said input value by a multiplicative factor and adding an additive factor (see C 10 L 31-39).

**Regarding claim 14**

Beatty teaches said setting a duty cycle comprises scaling an input value representing a desired average current by a multiplicative factor and adding an additive factor, said scaling and adding resulting in a calculated duty cycle (see C 10 L 31-39).

**Regarding claim 15**

Beatty teaches wherein said scaling and adding are completed during a first PWM period and said calculated duty cycle is effective in said pulse-width modulation during a second PWM period immediately following said first PWM period (see C 8 L 22-31).

**Regarding claim 17**

Beatty teaches wherein said measuring an average current comprises: during a sampling interval, integrating a signal proportional to said current using said dual-slope integrator, said integrating resulting in an integrated signal (see C 6 L 19-36); determining a magnitude of said integrated signal (see C 6 L 36-51); and using said magnitude of said integrated signal and a length of said sampling interval to calculate a measured average current (see C 6 L 52-64).

**Regarding claim 18**

Beatty teaches wherein said sampling interval is a PWM period (see FIG. 2-5).

**Regarding claim 19**

Beatty teaches an error calculator for comparing said measured average current to an input value representing a desired average current and for calculating an error value based on said comparing (see C 6 L 52-64).

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**Regarding claim 20**

Beatty teaches wherein said input value is a digital representation of an input voltage (see C 10 L 15-20).

**Regarding claim 21**

Beatty teaches wherein said duty cycle calculator calculates said duty cycle by scaling said input value by a scalar and adding an additive factor, said scaling and adding resulting in a calculated duty cycle (see C 10 L 31-39).

**Regarding claim 22**

Beatty teaches wherein said scaling and adding are completed during a first PWM period and said calculated duty cycle is effective in said pulse-width modulation during a second PWM period immediately following said first PWM period (see C 8 L 22-31).

**Regarding claim 27**

Beatty teaches wherein said duty cycle calculator calculates said duty cycle by scaling an input value representing a desired average current by a scalar and adding an additive factor (see C 10 L 31-39).

**Regarding claim 28**

Beatty teaches wherein, if said input value is received during a first PWM period, said duty cycle calculator calculates said duty cycle for effectiveness in said pulse-width modulation signal during a second PWM period, said second PWM period immediately following said first PWM period (see C 8 L 22-31).

**Regarding claim 30**



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Beatty teaches wherein (a) comprises: determining a duration of de-integration of an integrated signal, said integrated signal having been integrated during a sampling interval by said dual-slope integrator from a signal proportional to the current provided to said electronic device (see C 6 L 19-36); and using said duration and a length of said sampling interval to calculate said measured average current (see C 6 L 52-64).

**Regarding claim 31**

Beatty teaches wherein said sampling interval is a PWM period (see FIG. 2-5).

**Regarding claim 32**

Beatty teaches wherein (b) comprises: comparing said measured average current to an input value representing a desired average current; and regulating said duty cycle of said pulse-width modulation signal based on said comparing (see C 9 L 54 to C 10 L 15).

**Regarding claim 33**

Beatty teaches wherein said input value is a digital representation of an input voltage (see C 10 L 15-20).

**Regarding claim 34**

Beatty teaches wherein said duty cycle is computed by scaling said input value by a multiplicative factor and adding an additive factor (see C 10 L 31-39).

**Regarding claim 39**

Beatty teaches wherein (b) comprises scaling an input value representing a desired average current by a multiplicative factor and adding an additive factor, said scaling and adding resulting in a calculated duty cycle (see C 10 L 31-39).

**Regarding claim 40**

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Beatty teaches wherein said scaling and adding are completed during a first PWM period and said calculated duty cycle is effective in said pulse-width modulation during a second PWM period immediately following said first PWM period (see C 8 L 22-31).

***Allowable Subject Matter***

8. Claims 10-13, 23-26 and 35-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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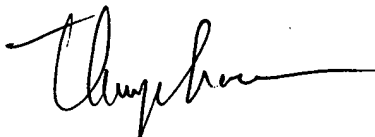
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner *Thomas Pham*; whose telephone number is (571) 272-3689, Monday - Thursday from 6:30 AM - 5:00 PM EST or contact Supervisor *Mr. Anthony Knight* at (571) 272-3687.

Any response to this office action should be mailed to: **Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450**. Responses may also be faxed to the **official fax number (571) 273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Thomas Pham**  
*Patent Examiner*

A handwritten signature in black ink, appearing to read 'Tham Pham', with a long horizontal flourish extending to the right.

July 24, 2006